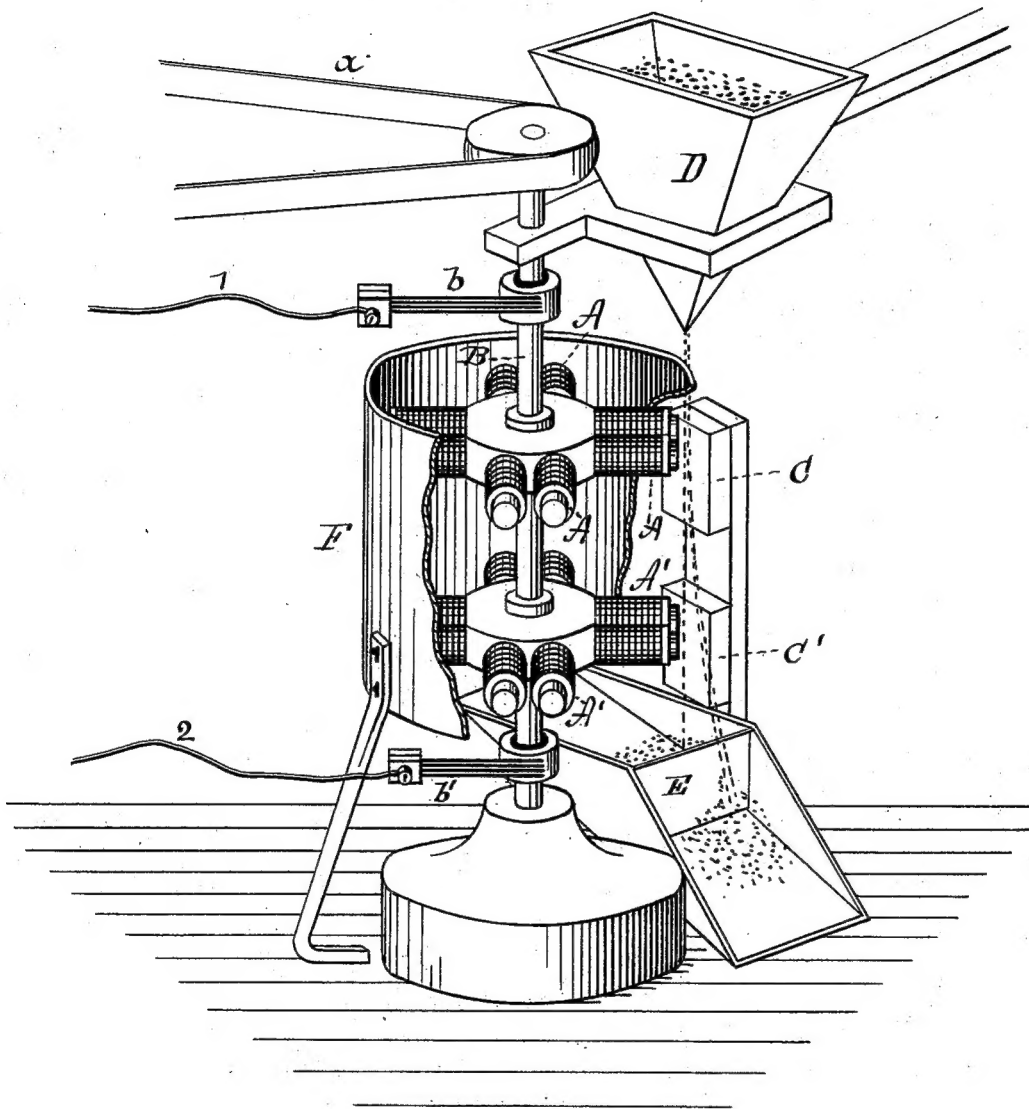


(No Model.)

T. A. EDISON.  
ORE SEPARATOR.

No. 400,317.

Patented Mar. 26, 1889.



WITNESSES:

*D. W. Mott*  
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ATTORNEY.

# UNITED STATES PATENT OFFICE.

THOMAS A. EDISON, OF MENLO PARK, NEW JERSEY, ASSIGNOR TO THE EDISON ORE MILLING COMPANY, (LIMITED,) OF NEW YORK, N. Y.

## ORE-SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 400,317, dated March 26, 1889.

Application filed August 25, 1882. Serial No. 70,289. (No model.)

*To all whom it may concern:*

Be it known that I, THOMAS A. EDISON, of Menlo Park, in the county of Middlesex and State of New Jersey, have invented a new and useful Improvement in Ore-Separators, (Case 340;) and I do hereby declare that the following is a full and exact description of the same, reference being had to the accompanying drawing, and to the letters of reference marked thereon.

In United States Patent No. 228,329, granted to me June 1, 1880, I have described and shown a method and apparatus for separating magnetic from non-magnetic substances by changing the trajectory of the magnetic portion of a falling body of material without stopping its fall.

Now it is the object of my present invention to produce another method and apparatus for separating mingled substances by acting upon that portion of a falling body which is a good conductor of electricity and changing its trajectory without stopping its fall, the invention being especially applicable to the separation from earth and sand of particles of gold and other metals which are non-magnetic but are good conductors of electricity. This I accomplish by allowing the mingled substances to fall through a magnetic field and by moving the magnet or magnets to shift the lines of force so as to change the trajectory of the good conductors. The conducting particles in falling through the magnetic field cut the lines of force at right angles and have currents of electricity generated in them, causing them to be affected by the shifting of the magnetic lines, while the bad or non conductors, if affected at all, are not acted upon to the same extent as the good conductors.

In carrying out my invention I arrange radially upon a vertical spindle a number of horizontally-projecting electro-magnets, which are connected with a source of energy (preferably one or more dynamo or magneto electric machines) by means of conductors and commutator brushes or springs. The vertical spindle is revolved by an electromotor, or by direct connection with the engine that drives the dynamo or magneto electric machine.

Upon a frame or support at a suitable distance from the paths described by the poles of the magnets are arranged armatures of iron, there being an armature for each radial set of magnets on the spindle. Directly above the space between the armatures and magnets is a hopper having a single small opening in its bottom located in line with the center of this space, and below the space is a vertical partition, upon opposite sides of which the conductors and non-conductors fall. The magnets are surrounded by an inclosing-cylinder, so that the disturbance of the air caused by their movement will not affect the falling body of material.

In operation the magnets are energized and revolved, producing a magnetic field between them and the armatures, the lines of force being constantly advanced in the direction that the magnetic poles move. The mingled conductors and non-conductors fall in a small stream through this field, and while the non-conductors drop in a straight line, or substantially so, upon one side of the partition, the conductors become electrically charged by cutting the lines of force, and are deflected by the movement of such lines to the other side of the partition.

It is evident that the armatures may be revolved, instead of the electro-magnets, with the same results.

The foregoing will be better understood by reference to the drawing, in which the apparatus is represented in perspective, the inclosing-cylinder being partly broken away to show the magnets.

A A' represent the electro-magnets, and B the vertical spindle that supports them, revolved by belt *a*.

1 and 2 are the conductors from the dynamo or magneto electric machine, and *b* and *b'* the commutator brushes or springs.

C C' are the iron armatures; D, the hopper; E, the dividing-partition, and F the inclosing-cylinder.

What I claim is—

1. The method of separating mingled conductors and non-conductors of electricity, consisting in causing them to fall together through a magnetic field whose lines of force are constantly shifting, whereby the trajectory

of the conducting substances is changed, substantially as set forth.

2. The combination of magnets and armatures which are relatively movable, and a hopper situated over the space between said magnets and armatures, whereby the trajectory of material falling from said hopper may be changed, substantially as set forth.

3. The combination of the revolving electro-magnets, the stationary armatures, and

the hopper situated over the space between said magnets and armatures, whereby the trajectory of material falling from said hopper may be changed, substantially as set forth.

This specification signed and witnessed this 15  
11th day of August, 1881.

THOS. A. EDISON.

Witnesses:

RICHD. N. DYER,  
H. W. SEELY.